

PATENT ABSTRACTS OF JAPAN

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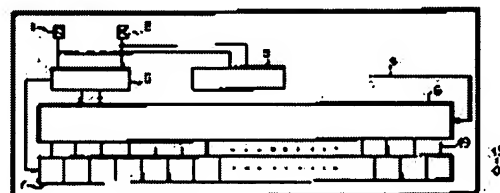
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(54) PHOTOELECTRIC CONVERTER, AND IMAGE SENSOR USING THE CONVERTER AND IMAGE INPUT SYSTEM USING THE SENSOR

(57)Abstract:

PROBLEM TO BE SOLVED: To attain multi-function and low cost by to generating a resolution control signal for controlling the resolution through the use of an external clock signal and a start signal thereby realizing resolution switching without the need for provision of a control terminal.

SOLUTION: A clock pulse and a start pulse received from input terminals 1, 2 are given to a shift register 6 to shift a signal in the shift register 6 depending on the clock pulse via a timing generating circuit 5. Simultaneously, both external pulses are also given to a resolution control signal generating circuit 3. In this case, the start pulse with a pulse width corresponding to a desired resolution is given to the circuit 3 whose output control signal is set to a high or a low level depending on the pulse width and the output control signal is given to the shift register 6 through a signal line 4. A read pulse from the shift register 6 is used to read a signal voltage generated in light receiving elements such as photo-diodes through photoelectric conversion in a light receiving element array 7 serially in time series and the signal voltage is outputted from an output terminal 18.



LEGAL STATUS

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to-dimensional [which has a resolution switch function / 1], the photo-electric-conversion equipment which prepared the start signal input terminal and the clock signal input terminal in the two-dimensional photo-electric-conversion chip, the contact type image sensor which mounted two or more them, and the image read-out system using it.

[0002]

[Description of the Prior Art] Development of the contact type image sensor using a twice system, such as having multi-mounted CCD using contraction optical system and two or more semi-conductor photosensor chips in the field of the photo-electric-conversion equipment of a single dimension in recent years, is performed positively, a user switches the resolution of roughness and fineness in accordance with use conditions, and the contact type image sensor which can read an image is also proposed.

[0003] Drawing 7 is the circuit diagram of the integrated circuit for contact type image sensors proposed by JP,5-227362,A. In this conventional technique, when a control terminal (125) is prepared in an image-sensors chip and a user inputs the signal of Hi or Lo into that terminal, a shift register is controlled and resolution is switched.

[0004] If an outline is explained about the contact type image sensor hung up over drawing 7, a start pulse SI and a clock pulse CLK will be supplied to the shift register group 104. If shift register group 104a is started by the start pulse SI, the output will be inputted into channel select switch 103a through NOR-gate 121a and AND-gate 120a, will turn this ON, and will take out the signal from photocell 1a to signal-line 107a. Other shift registers 104b-104f carry out sequential starting, and output the signal from each photocells 101b-101f. to 107a and 107b.

[0005] Here, if the control signal Hi is inputted into the control signal input terminal 125, analog switches 110a, 110b, 122a, and 122b will be changed, and a picture signal will be acquired by the image output terminal 111 by 16 dot [/mm] the consistency of reading. Moreover, if the control signal Lo is inputted into the control signal input terminal 125, analog switch 110a will always be in an ON state, and a picture signal will be acquired from photocell 101a by the image output terminal 111 by 8 dot [/mm] the consistency of reading of the one half of 101f. of the whole.

[0006] That is, in case an output picture signal is taken out outside, a part can be made to thin out and output with a control signal, although 101f. of total is always operating from photocell 101a on Sensor IC. Therefore, what the voltage level of a picture signal becomes always fixed, the configuration of the image-processing circuit of this image-sensors latter part is the conventional thing, and correspondence of it is attained for is indicated.

[0007]

[Problem(s) to be Solved by the Invention] However, since the above-mentioned conventional contact type image sensor multi-mounts two or more chips on a mounting substrate, it has the problem that a manufacturing cost becomes high, by using the above-mentioned conventional technique.

[0008] That is, since the number of terminals required for a resolution switch increases and a wire-bonding process increases, one is the problem that these image sensors carry out a cost rise.

[0009] When the example of the conventional technique is given, also at the lowest, a terminal required for the signal transduction of a chip and the exterior Six (the start pulse output terminal SO connected to the supply voltage input terminals VDD and GND of photo-electric-conversion equipment, the start pulse input terminals SI and CLK of photo-electric-conversion equipment 1 chip, and the start pulse input terminal SI of degree chip, and a picture signal) per one chip The output terminal SIG to output is required, and if 15 chips are multi-mounting at one train, a total of 90 wirebonding is required. When using the above-mentioned conventional technique for this, supposing one wirebonding per further 1 chip is added for a control terminal required for a resolution switch, a total of 105 wirebonding is needed.

[0010] Moreover, since wiring on a mounting substrate increases, it is not avoided that a mounting substrate becomes

large compared with the case where there is no control terminal, but it also has the cost rise produced by newly preparing wiring of a control terminal on a mounting substrate further.

[0011] Therefore, when realizing a resolution switch of a contact type image sensor using the conventional technique, the problem that a manufacturing cost will become high is not avoided as compared with the case where there is no resolution switch.

[0012] (The purpose of invention) Without preparing a control terminal as shown in the above-mentioned conventional technique, the purpose of this invention is what proposes the new configuration which realizes a resolution switch of photo-electric-conversion equipment, and is to offer photo-electric-conversion equipment cheap at various functions.

[0013]

[Means for Solving the Problem] In order to solve the above-mentioned problem, the photo-electric-conversion equipment of this invention is characterized by having a resolution control signal generation means to generate the resolution control signal which controls resolution using the input of said clock signal and said start signal in the photo-electric-conversion equipment which controls actuation by the clock signal and start signal which are inputted from the outside.

[0014] Moreover, in the image sensors which mounted two or more photo-electric-conversion equipments which control actuation by the clock signal and start signal into which the image sensors of this invention are inputted from the outside, said photo-electric-conversion equipment is characterized by having a resolution control signal generation means to generate the resolution control signal which controls resolution using the input of said clock signal and said start signal.

[0015] Furthermore, when the image input system of this invention outputs a clock signal and a start signal, said photo-electric-conversion equipment driving means is characterized by to have a photo-electric-conversion equipment driving pulse modulation means input a resolution switch signal in the image input system possessing photo-electric-conversion equipment equipped with the photo-electric-conversion equipment driving means which controls actuation of photo-electric-conversion equipment, and a resolution control signal generation means generate the resolution control signal which controls resolution using the input of said clock signal and said start signal.

[0016] (Operation) This invention has a resolution switch function, without preparing a control terminal, in order to generate the control signal of a resolution switch using the clock signal and start signal of photo-electric-conversion equipment indispensable to motion control.

[0017]

[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained using a drawing.

[0018] (Operation gestalt 1) Drawing 1 is the circuit block diagram of one chip containing the optoelectric transducer in the photo-electric-conversion equipment in the operation gestalt 1 of this invention.

[0019]

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CLAIMS

[Claim(s)]

[Claim 1] Photo-electric-conversion equipment characterized by having a resolution control signal generation means to generate the resolution control signal which controls resolution using the input of said clock signal and said start signal in the photo-electric-conversion equipment which controls actuation by the clock signal and start signal which are inputted from the outside.

[Claim 2] Said resolution control signal generation means is photo-electric-conversion equipment according to claim 1 characterized by generating said resolution control signal by changing the pulse width of said start signal.

[Claim 3] Said resolution control signal generation means is photo-electric-conversion equipment according to claim 1 or 2 characterized by generating at least two or more kinds of resolution control signals.

[Claim 4] They are the image sensors characterized by having a resolution control signal generation means to generate the resolution control signal with which said photo-electric-conversion equipment controls resolution using the input of said clock signal and said start signal in the image sensors which mounted two or more photo-electric-conversion equipments which control actuation by the clock signal and start signal which are inputted from the outside.

[Claim 5] Said resolution control signal generation means are the image sensors according to claim 4 characterized by generating said resolution control signal by changing the pulse width of said start signal.

[Claim 6] Said resolution control signal generation means are image sensors according to claim 4 or 5 characterized by generating at least two or more kinds of resolution control signals.

[Claim 7] It is the image input system characterized by to have a photo-electric-conversion equipment driving pulse modulation means to by_ which said photo-electric-conversion equipment driving means inputs a resolution switch signal in the image input system possessing photo-electric-conversion equipment equipped with the photo-electric-conversion equipment driving means which controls actuation of photo-electric-conversion equipment by outputting a clock signal and a start signal, and a resolution control signal generation means generate the resolution control signal which controls resolution using the input of said clock signal and said start signal.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the circuit block diagram of the photo-electric-conversion equipment in the operation gestalt 1 of this invention.

[Drawing 2] It is the representative circuit schematic of the signal generation circuit shown in the operation gestalt 1.

[Drawing 3] It is the timing chart of the signal generation circuit shown in the operation gestalt 1.

[Drawing 4] It is the circuit block diagram of the photo-electric-conversion equipment in the operation gestalt 2 of this invention.

[Drawing 5] It is the timing chart of the signal generation circuit shown in the operation gestalt 2.

[Drawing 6] It is the circuit block diagram of the photo-electric-conversion equipment in the operation gestalt 3 of this invention.

[Drawing 7] It is the circuit diagram of the integrated circuit for contact type image sensors of the conventional technique.

[Description of Notations]

- 1 Clock (CLK) Input Terminal
- 2 Start Pulse (SP) Input Terminal
- 3 3' Signal generation circuit
- 4 Control Signal Line (PhiM)
- 5 Timing Generating Circuit
- 6 Shift Register
- 7 Photo Detector Array
- 8 Delay Circuit (1)
- 9 Delay Circuit (2)
- 10 Control Signal Line 1 (PhiM1)
- 12 Control Signal Line 2 (PhiM2)
- 13 Light Source
- 14 Driving Means
- 15 Driving Pulse Modulation Means
- 16 Signal-Processing Means
- 17 CPU
- 18 Output Terminal
- 19 Scanning Line

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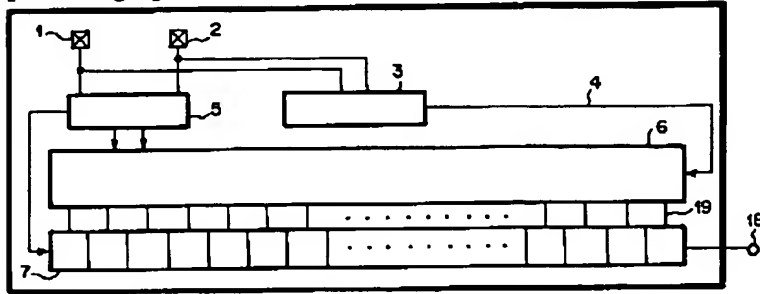
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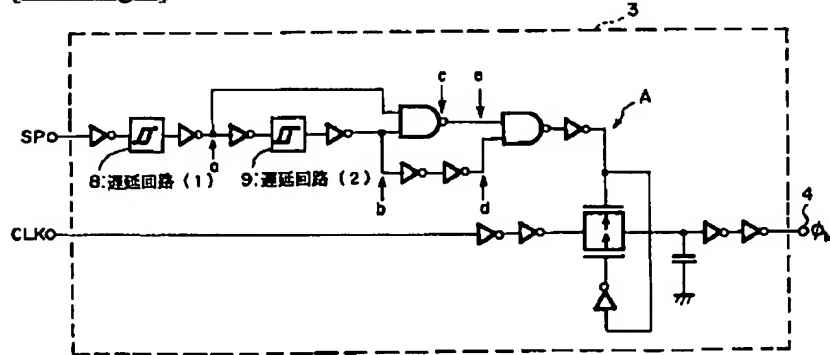
DRAWINGS

[Drawing 1]

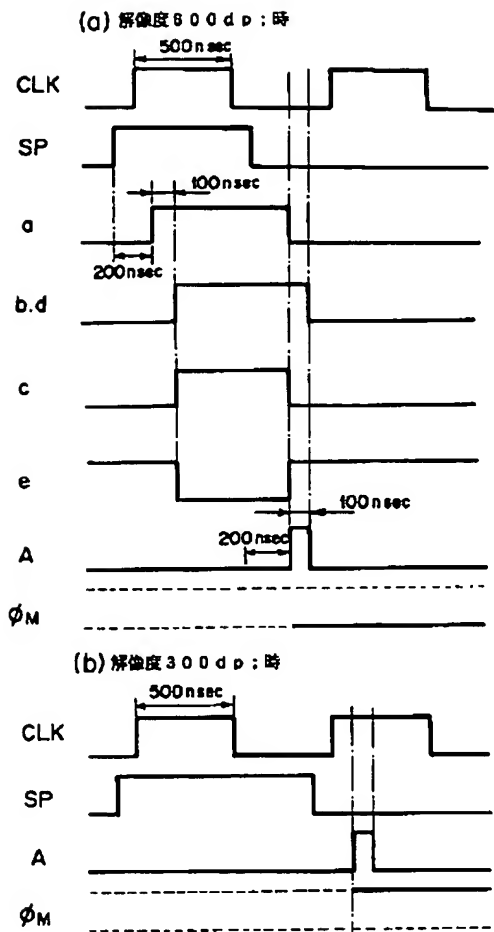


- | | |
|-----------------|-------------|
| 1 : クロック入力端子 | 6 : シフトレジスタ |
| 2 : スタートパルス入力端子 | 7 : 受光素子アレイ |
| 3 : 解像度制御信号生成回路 | 18 : 出力端子 |
| 4 : 解像度制御信号線 | 19 : 定査線 |
| 5 : タイミング発生回路 | |

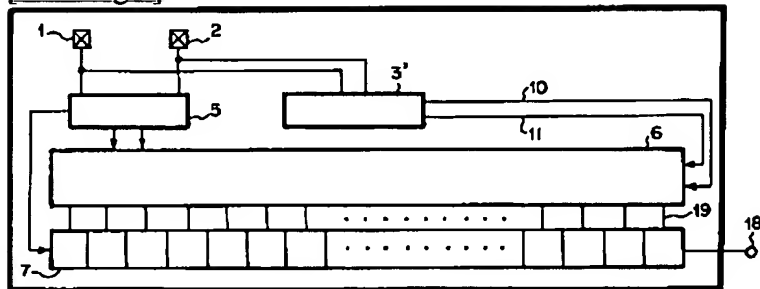
[Drawing 2]



[Drawing 3]

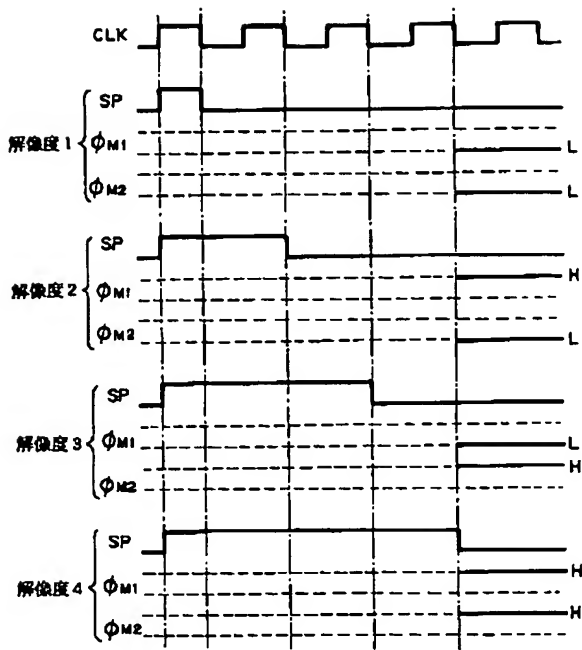


[Drawing 4]

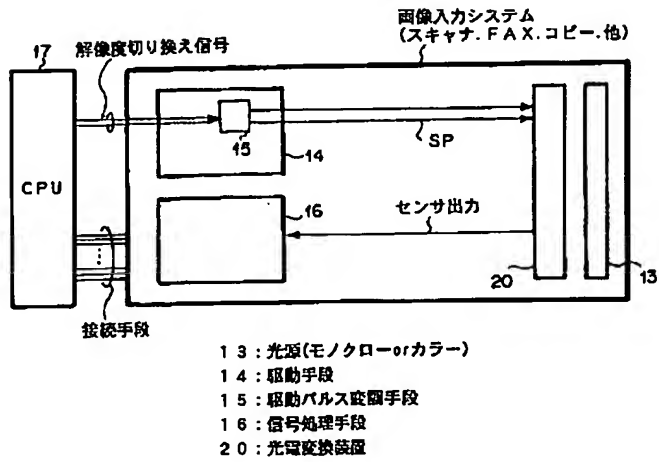


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|------------------|-----------------|
| 1 : クロック入力端子 | 10 : 解像度制御信号線 1 |
| 2 : スタートパルス入力端子 | 11 : 解像度制御信号線 2 |
| 3' : 解像度制御信号生成回路 | 18 : 出力端子 |
| 5 : タイミング発生回路 | 19 : 走査線 |
| 6 : シフトレジスタ | |
| 7 : 受光素子アレイ | |

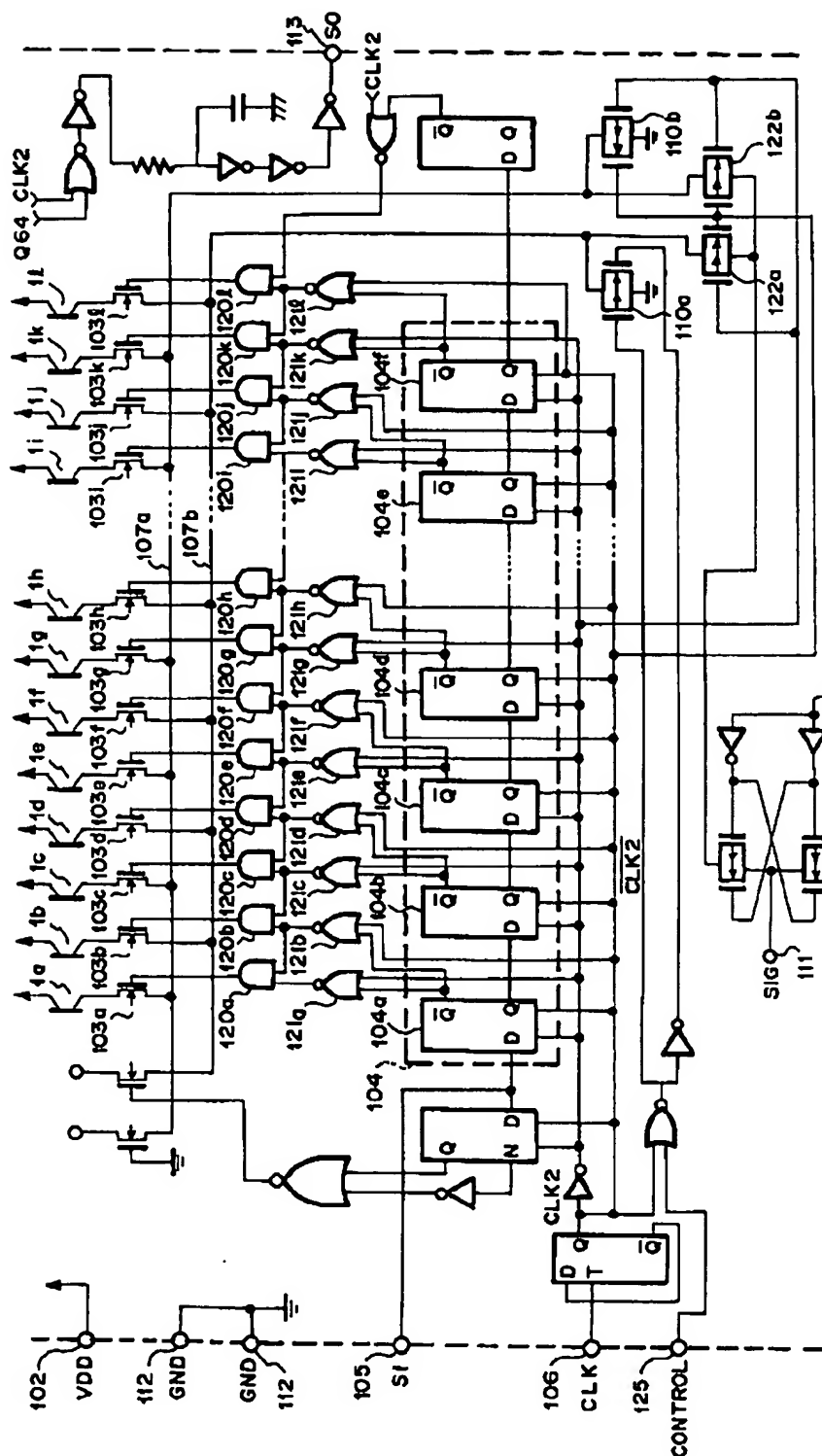
[Drawing 5]



[Drawing 6]



[Drawing 7]



1 a ~ 1 f : フォトセル
 103 a ~ 103 f : チャンネルセレクトスイッチ
 104 : シフトレジスタ群
 7 a, 7 b : 信号ライン
 110 a, 110 b : アナログスイッチ
 111 : 画像信号出力端子